Updates for the Back-to-back Frame Benchmark

draft-morton-bmwg-b2b-frame-00

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Background

- RFC 2544 specifies the method to measure the Back-to-Back Frame Benchmark

- Defined in RFC 1242 – Longest burst of frames a DUT can process without loss

  - "Tests of this parameter are intended to determine the extent of data buffering in the device."

- Very concise Objective, Procedure, and Reporting

Recent Tests @VSPERF

- Presented at IETF-99

- [OPNFV-2017] https://wiki.opnfv.org/download/attachments/10293193/VSPERF-Dataplane-Perf-Cap-Bench.pptx?api=v2

- [VSPERF-b2b] https://wiki.opnfv.org/display/vsperf/Traffic+Generator+Testing#TrafficGeneratorTesting-AppendixB:Back2BackTestingTimeSeries(fromCI)

Several Notable Aspects of the results:

1. Back-to-back Frame Benchmark was very consistent for some fixed frame sizes, and somewhat variable for others.

2. The Back-to-back Frame length reported for large frame sizes was unexpectedly long, and no explanation or measurement limit condition was indicated.

3. Calculation of the extent of buffer time in the DUT helped explain the results with all frame sizes (some frame sizes cannot exceed the frame header processing rate of the DUT, and therefore no buffering occurs).

4. It was observed that the actual buffer time in the DUT could be estimated using results from the Throughput tests conducted according to Section 26.1 of [RFC2544].

Throughput test results from [RFC2544] can be used to reduce the number of Frame Sizes tested.

Expanding the B2B Frames Method

- Pre-requisite Tests: RFC 2544 Throughput
  - Test setup and configuration must MATCH
  - Recommended Frame Sizes; MUST be zero-loss
  - Reduce Frame size set for B2B (e.g., 64 and 128)

OVS and VPP-RFC2544: FPS vs Packet Size - Single Flow, Bidirectional

[OPNFV-2017]
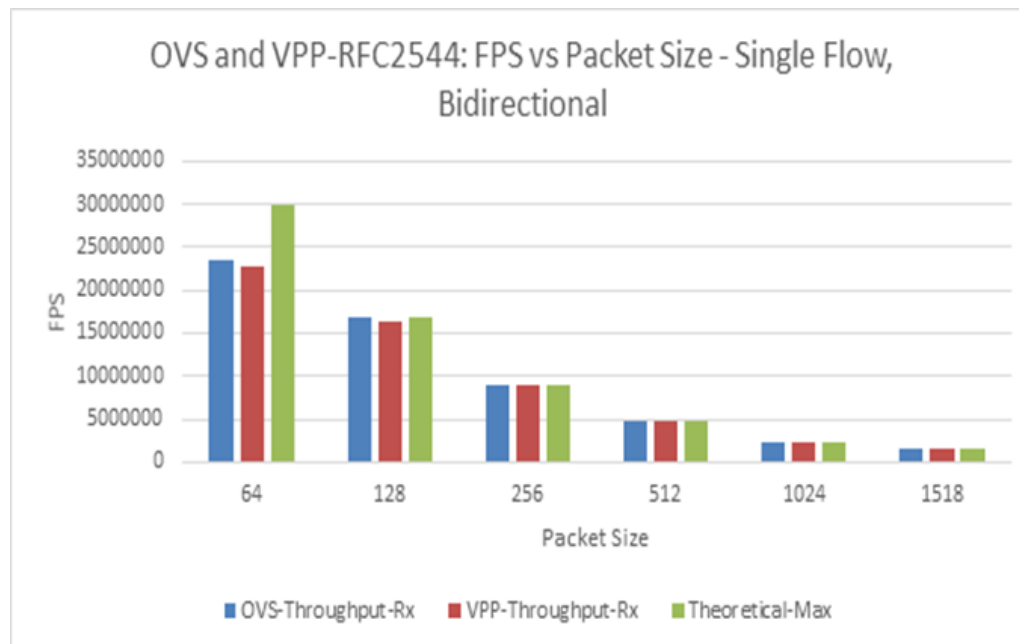
Procedure*

- List of Frame Sizes selected from TPUT tests
- Tests are composed of Repeated Trials
- For Each Frame size, a Trial requires sending a burst length counting forwarded frames
- Trials seek the longest burst length with 0 loss
- Test outcome is the burst length
- Tests are Repeated (N times), burst lengths are Averaged
- Average length is the Benchmark

Benchmark Calculations

For each Frame size, calculate the following summary statistics for Back-to-back Frame values over the N tests:

o   Average (Benchmark)   o   Minimum

o   Maximum   o   Standard Deviation

Further, calculate the Implied DUT Buffer Time and the Corrected DUT Buffer Time in seconds, as follows:

Implied DUT Buffer Time =

    Average Back-to-back Frames / Max Theoretical Frame Rate

Corrected DUT Buffer Time =

                              Measured Throughput
    Implied DUT Buffer Time * --------------------------
                              Max Theoretical Frame Rate

Reporting

If the tester operates using a maximum burst length in frames, then this maximum length SHOULD be reported.

Frame Size, octets	Ave B2B Length, frames	Min,Max,StdDev	Corrected Buff Time, Sec
64	26000	25500,27000,20	0.00004

Back-to-Back Frame Results

Static and configuration parameters:

Number of test repetitions, N

Minimum Step Size (during searches), in frames.

Next Steps

- Please Read and send your Review to the list
- WG could create a milestone for this work, if BMWG wants it on our charter…
  - Dec 2018 - Methodology Update for SDV Back-to-back Frames to IESG Review
- Future WG adoption for this draft
  - no guarantee that this draft would satisfy the milestone
  - Other ideas always welcome…

To Do

- Fix URLs in References:
    - [VSPERF-b2b] and [OPNFV-2017]

A small area for clarification

RFC 2544 Section 26.4 says:

The back-to-back value is the number of frames in the longest burst that the DUT will handle without the loss of any frames. The trial length MUST be at least 2 seconds and <u>SHOULD be repeated at least 50 times with the average of the recorded values being reported</u>.

@@@@ What should be repeated?
Trial outcomes are loss or no-loss for a given burst length.
Repeating the search for longest burst makes more sense...

BACKUP

Title

(continued)